



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/EP84/00273 (22) International Filing Date: 5 September 1984 (05.09.84) (31) Priority Application Number: 205482 (32) Priority Date: 5 September 1983 (05.09.83) (33) Priority Country: NZ (71) Applicant (for all designated States except US): TECH- NOPLAST B.V. [NL/NL]; 4A, Vlotlaan, NL-2680 AA Monster (NL). (72) Inventors; and (75) Inventors/Applicants (for US only) : LUGTIGHEID, Ar- nold [NL/NL]; 15, Esdoornlaan, NL-3442 HA Woerd- en (NL). REIJENGA, Tjerk [NL/NL]; 9, Jacoba Van Beierenlaan, NL-3233 AP Oostvoorne (NL).		(74) Agent: MULLER & EILBRACHT B.V.; 4, Jasmijnhof, P.O. Box 1080, NL-2260 BB Leidschendam (NL). (81) Designated States: AT (European patent), AU, BE (Eu- ropean patent), CH (European patent), DE (Euro- pean patent), DK, FR (European patent), GB (Euro- pean patent), JP, LU (European patent), NL (Euro- pean patent), SE (European patent), US. Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the</i> <i>claims and to be republished in the event of the receipt</i> <i>of amendments.</i>
(54) Title: PRE-STRETCHED TRANSPORTLOOP FOR THE TRANSPORT OF MEAT PIECES SUSPENDED FROM HOOKS		
(57) Abstract <p>A pre-stretched transportloop for the transport of meat pieces suspended from hooks, comprises a loop (4) which can be passed through a hole being prepicked in the meat, the upper loop portion (5) serving for the suspension of a piece of meat and the lower loop portion serving for holding said piece of meat. The loop is totally made of a plastic material and the lower loop portion preferably comprises a holding portion protruding at least sideways and being integral with the upper loop portion, said holding portion (10) having a steady shape and standing at right angles to the main direction of the transportloop so as to prevent any sliding of the loop through and out of the meat respectively. However an endless transportloop is also provided for. Using preferred plastic material like polypropylene, the transportloop, either provided with a holding portion or shaped as an endless loop, is obtained by a pre-stretching method after an initial shape is produced. Compared with the initial length the stretching substantially amounts four to six times its original length.</p> <div data-bbox="1096 1102 1323 1936" style="text-align: right;"> </div>		

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Pre-stretched transportloop for the transport of meat pieces suspended from hooks.

05 The invention relates to a transportloop for the transport of meat pieces suspended from hooks, comprising a loop which can be passed through a hole being prepicked in the meat, the upper loop portion serving for the suspension of a piece of meat and the lower loop portion serving for holding said piece of meat.

10 Such transportloops are knotted from a string and passed through the meat, whereafter the upper end of the loop is passed through the lower end, and then the free end of the loop with the piece of meat is suspended. The string is knotted by means of a machine. However, because the machine has to pass also the loopstring through the meat, serious operating failures are
15 causes very frequently owing to the clogging of the machine. The removal of these failures is taking up much time; in connection with the expenses to be incurred, one does not easily proceed to install a second reserve machine.

20 Now it appears that the knotting and later on passing through of the slack loop are just causing the above mentioned problems. Consequently, it will be appropriate to improve the construction of the loop.

25 According to the invention there is provided a transportloop in which the loop is totally made of a plastic material and the lower loop portion comprises a holding portion protruding at least sideways and being integral with the upper loop portion, said holding portion having steady shape and standing at right angles to the main direction of the transportloop so as to prevent any sliding of the loop through and out of the meat respectively.

30 In order to ensure that the holding portion has the desired position with respect to the loop, the lower portion lying above the holding portion has the form of a bar having preferably a round cross-section.

35 Essentially, the holding portion can have each form to prevent said sliding through and out of meat respectively; a ball or, a rather great disc fulfils such a function, but preferably the holding portion consists of a polygonal plate, preferably a rectangular plate, which is supported by at least one

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stiffening rib. In this way the advantages of the invention are achieved with relatively little material.

05 Preferably, the holding portion has a round or oval shape and on the lower side of the holding portion a stiffening rib is provided, preferably in the form of a sector. The longer the loop will be the more easier the loop can be handled; however, the length of the bar-shaped portion being above the holding portion is not permitted to be too small and has to be substantially less than the greatest dimension of the holding portion.

10

During the transport rather high tensile strain occurs in the transportloop when, e.g. with a shock, the meat is caught by the holding portion and, consequently, the additional impact stress will also have to be compensated by the cross-section surfaces being under tensile strain. Therefore, preferably 15 the total sum of the cross-section surfaces of the loop lying above the holding portion is less than the greatest dimension of the holding portion.

For practical reasons it has further been shown that, contrary to known transportloop, the transportloop of the invention is able to be used in a multiple 20 way. This is possible because the transportloop of the invention is made in one piece from smooth plastic material without having knots. Preferably a high firm plastic material, such as polypropylene is used.

When the transportloop according to the present invention is intended to 25 carry pieces of meat having a relatively heavy weight, the cross-section of the loop portion should be adapted to such a weight by making use of substantially more material from which the transportloop is formed. In case as material polypropylene is chosen which is a relatively expensive material, the use of more material would mean that the transportloop would become 30 rather expensive. Moreover, on using more material greater dimensions of the injection moulds would be required which entails also greater expenses.

To avoid said disadvantages and to obtain relatively cheap transportloops suited to carry heavy meat pieces, the present invention provides for a 35 method in which the transportloop is made in one piece of polypropylene material by an injection moulding process, in which on manufacturing the length of the loop portion is chosen substantially $1/4$ - $1/6$ times the ultimately contemplated length of the loop portion, and in which after said moulding process

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by means of a stretching process the loop portion is stretched with a stretching ratio of substantially 4:1 till 6:1 till the ultimate length is reached.

05 By this method the advantages are achieved that relatively few material will have to be used, while the required strength of the loop portion is obtained by the stretching process, in which the loop portion 4-6 times the original length is stretched and by that, as a special characteristic of the polypropylene material, the material is strengthened. By using relatively few material the dimensions of the injection moulds can be kept small and, consequently
10 inexpensive. The cross section of the stretched loop portion is less than the injection moulded portion, yet the allowable yield strength has substantially improved.

15 In the foregoing the advantages of the pre-stretched transportloop provided with a holding portion have been described. If however for reasons of cost-price and/or in view to the specific weight of meat pieces to be transported, a single pre-stretched endless transportloop will be preferred, such a transportloop is also claimed under the scope of this invention.

20 A closed ring ring shape would suffice and any method of arriving to such a shape, which thereafter is pre-stretched, could thus be adopted. Separate rings may be moulded to that purpose, but "slicing" from a tubular moulded rod, either perpendicular or obliquely with respect to its axis, could be chosen. Any adopted method for preparing an endless transportloop as provided for
25 would consider the acceptable molecular aspects of the material after having been stretched. In the foregoing the indication "polypropylene" should be considered in such a broad sense as to include any and all material having similar material features to enable the described pre-stretching method.

30 Fig. 1 shows a known transportloop being made by a machine and consisting of a normal string;

Fig. 2 is a front view of a transportloop according to the invention;

Fig. 3 is a side view of the transportloop shown in fig. 2;

35 Fig. 4 is a front view of a further embodiment of a transportloop according to the invention;

Fig. 5 is a side view of the transportloop shown in fig. 4;

Fig. 6 shows a lead-through tool for leading or -passing the transportloop

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through the meat; and

Fig. 7 is a view of a transportloop made in accordance with the method of the invention.

05 The known transportloop 1, shown in fig. 1, comprises a knot 2, which has been made before by means of a machine. That machine is working with a needle which pricks the loop through the meat and thereafter is retracted again (not shown). After both ends of the loop have been passed through each other, as shown in fig. 1, the piece of meat 3 can be held thereon.

10

Fig. 2 and 3 show a preferred embodiment of a transportloop 4, the upper end 5 which has the same function as the usual normal loop. However, in this embodiment this end 5 is extended downwards is a bar-shaped portion 6. The cross-section 7 of the upper portion is oval, the cross-section 8 of the bar-shaped portion 6 is round, in which the tensile forces being generated are taken up practically everywhere by the same cross-section surface of the transportloop.

Further downwards via a rounding 9 the bar-shaped portion 6 passes into a flat plate 10 which is at right angles to the bar-shaped portion 6 and has a shape that is shown in a bottom view in fig. 2. The plate 10 has an oval form and is provided with a stiffening rib 11 which extends substantially along the length of the plate 10. That stiffening rib 11 provides the plate 10 for the desired strength at the lower end of the transportloop such that the meat cannot be stripped off from the bar-shaped portion. That measure ought to be used in such a way, that obviously the hole being prepicked in the meat shall not be greater than the cross-section of the bar-shaped portion 6. It is preferred that the height of the bar-shaped portion 6 is substantially equal to the length of the plate 10 and already by that the own stiffness of the holding portion 10 with respect to the loop 4 is secured. On account of the length of the transport loop it will be rather easy to pass the upper portion of the loop together with a tool, e.g. a kind of piercer, see fig. 6, through the meat.

35 In fig. 4 and 5 further embodiment of a transportloop 12 is shown. With respect to the first embodiment of the transportloop 4, as described above, the only difference is that the bar-shaped portion 13 is much longer than the length

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of the corresponding part 6. At times it can be advantageous to make the upper loop portion 14 smaller e.g. to provide for more friction with respect of the suspension hook, in combination with a rather stiff bar-shaped portion 13 which can be easily handled. In this embodiment, shown in Fig. 4 and 5, additional stiffening ribs 15 and 16 are provided on the holding portion 17. This holding portion has a substantially rectangular shape. Attention will have to be paid also here that the tensile forces occurring during the transport can be taken up by the relative cross-section surfaces of the loop portion.

10

Fig. 6 shows, by way of example, a hand tool for leading or passing the transportloop through a hole being prepicked in the meat. The front side of that tool, e.g. a piercer 18, is provided with a sharp nose part 19 and further backwards with a hook 20. The loop portion of the transportloop is hooked in that hook 20 and thereafter is passed through the meat. Then the piercer will be drawn back and thereafter the piece of meat is ready to be suspended from a hook being provided in a transport vehicle. The piercer can also be made as a part of a machine such that the transportloops can be hooked automatically. However, the invention is restricted to the novel inventive construction of the transportloop as well as to a method of manufacturing same, as described herinafter.

When the transportloop according to the invention is intended to carry heavy meat pieces, the cross-section of the loop portion should be adapted to such heavy weights by making use of more material. In case as material polypropylene is chosen which is a relatively expensive material, the use of more material would mean that the transportloop would become rather expensive. To obtain relatively cheap transportloops suited to carry heavy meat pieces a method for manufacturing is provided, in which the transportloop is made in one piece of polypropylene material by an injection-moulding process, in which on manufacturing the length of the loop portion is chosen substantially $1/4$ - $1/6$ times the ultimately contemplated length of the loop portion, and in which after said moulding process by means of a stretching process the loop portion is stretched with a stretch ratio of substantially 4:1 - 6:1 till the ultimate length is reached.

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The transportloop obtained by this method is shown in Fig. 7 and comprises a loop portion 21 and a flat holding plate 22 which is supported by stiffening

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05 ribs 23, 24. The transportloop is made in one piece of polypropylene material. By means of the injection-moulding process a transportloop is made having a relatively short loop portion B. After said process the loop portion is stretched with a stretch ratio of substantially 4:1-6:1 till ultimately a strong loop portion A is achieved.

10 So only few material will have to be used to obtain a transportloop having a loop portion with a sufficient length and a required strength so as to be able to carry relatively heavy pieces of meat. Moreover, by using only few material expenses as to the injection moulds can be reduced.

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CLAIMS

- 05 1. A pre-stretched transportloop for the transport of meat pieces suspended from hooks, comprising a loop which can be passed through a hole being prepicked in the meat, the upper loop portion serving for the suspension of a piece of meat and the lower loop portion serving for holding said piece of meat, characterized in that the loop is totally made of a plastic material and the lower loop portion comprises a holding portion protruding at least sideways and being integral with the upper loop portion, said holding portion having a steady shape and standing at right angles to the main direction of the transportloop so as to prevent any sliding of the loop through and out of the meat respectively.
- 15 2. A transportloop according to claim 1, characterised in that the lower portion lying above the holding portion has the form of a bar having preferably a round cross-section.
- 20 3. A transportloop according to claim 1 or 2, characterised in that the holding portion consists of polygonal plate, preferably a rectangular plate, which is supported by at least one stiffening rib.
4. A transportloop according to claim 1 or 2, characterised in that the holding portion has a round or oval shape and on the lower side of the holding portion a stiffening rib is provided, preferably in the form of a sector.
- 25 5. A transportloop according to any one of the preceding claims, characterised in that the length of the bar-shaped portion lying above the holding portion is less than the greatest dimension of the holding portion.
- 30 6. A transportloop according to claim 5, characterised in that the sum of the cross-section surfaces of the loop lying above the bar-shaped portion is greater than, but at least equal to the cross-section of the bar-shaped portion.
- 35 7. A transportloop according to any one of the preceding claims, characterised in that in order to maintain the steady shape of the loop is made in one piece from a highly firm plastic material, such as polypropylene.

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05 8. A method for manufacturing a transportloop according to any one of the preceding claims, characterised in that the transportloop is made in one piece of polypropylene material by an injection-moulding process, in which on manufacturing the length of the loop portion is chosen substantially $1/4 - 1/6$ times the ultimately contemplated length of the loop portion, and that after said moulding process by means of a stretching process the loop portion is stretched with a stretch ratio of substantially 4:1 - 6:1 till the ultimate length is reached.

10 9. A method for manufacturing a pre-stretched endless transportloop, characterised in that the transportloop is made in one single shape piece of a closed ring of polypropylene material by any moulding process in which on manufacturing the length of the loop portion is chosen substantially $1/4 - 1/6$ times the ultimately contemplated length of the loop portion, and that after said
15 moulding process by means of a stretching process the endless loop portion is stretched with a stretch ratio of substantially 4:1 - 6:1 till the ultimate length is reached.

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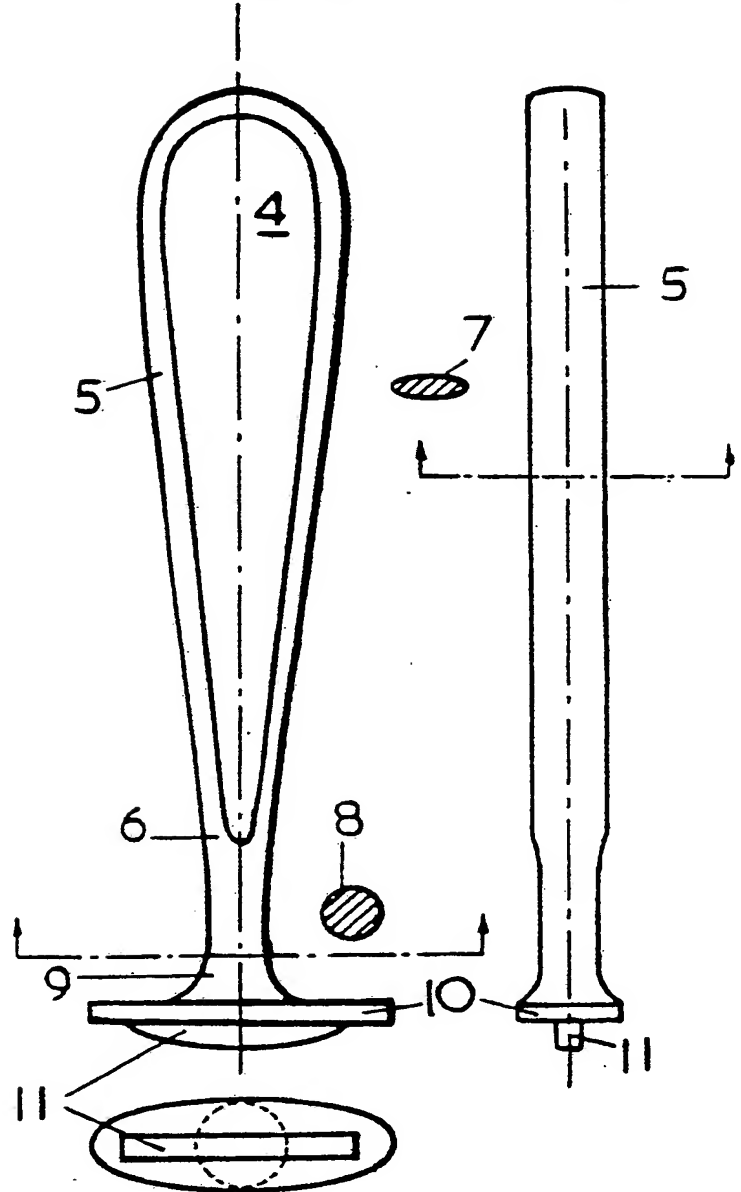
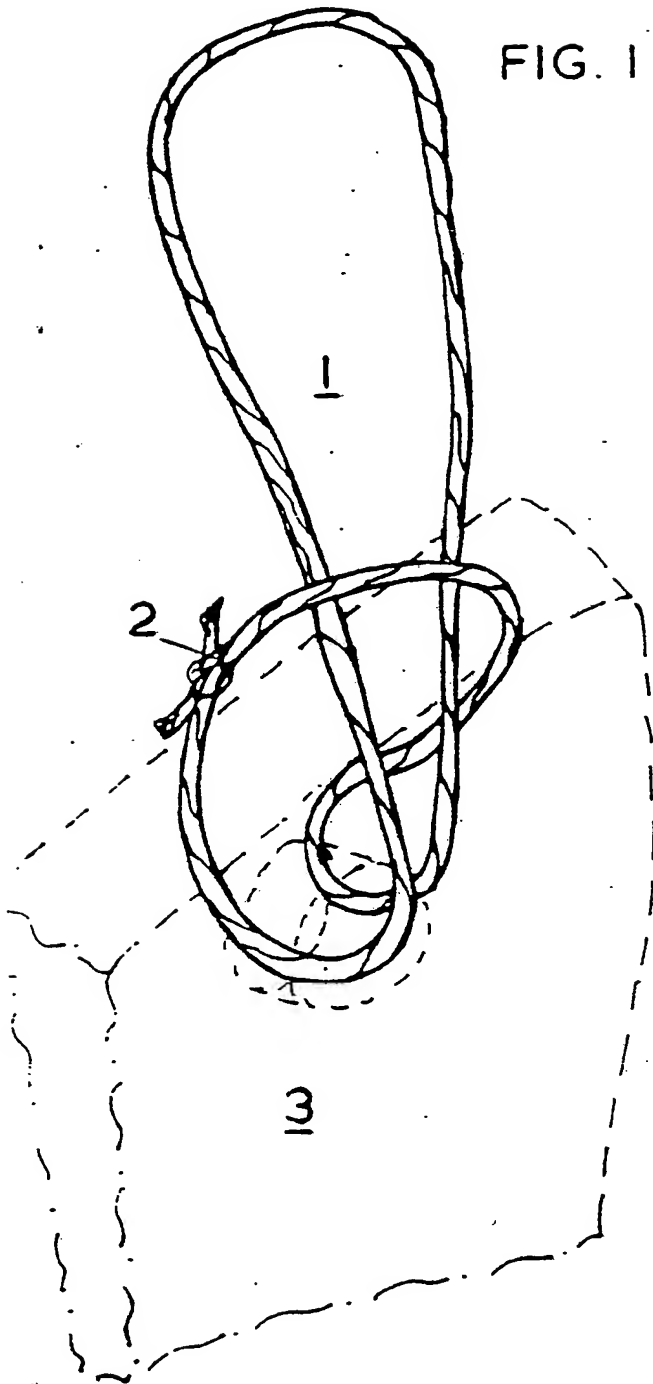
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FIG. 1

FIG. 2

FIG. 3



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FIG. 4

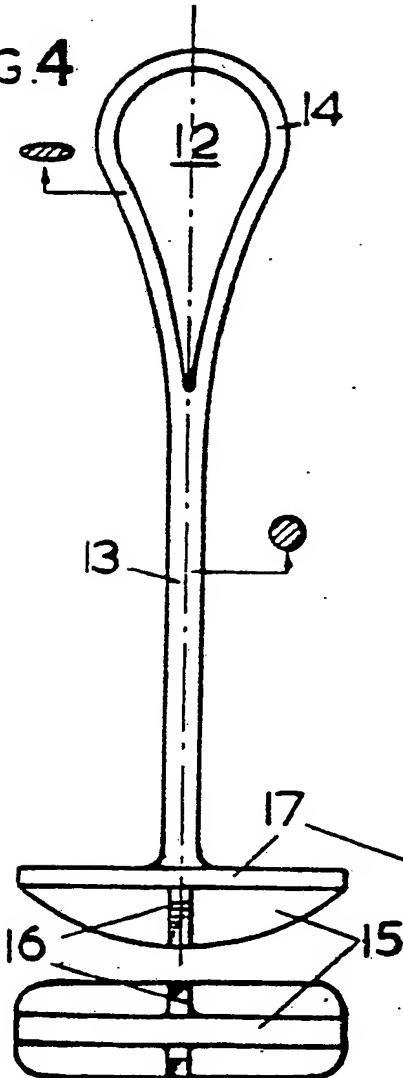


FIG. 5

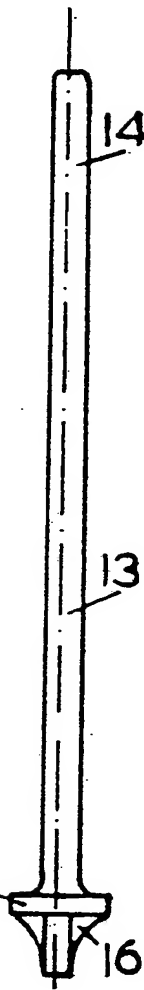
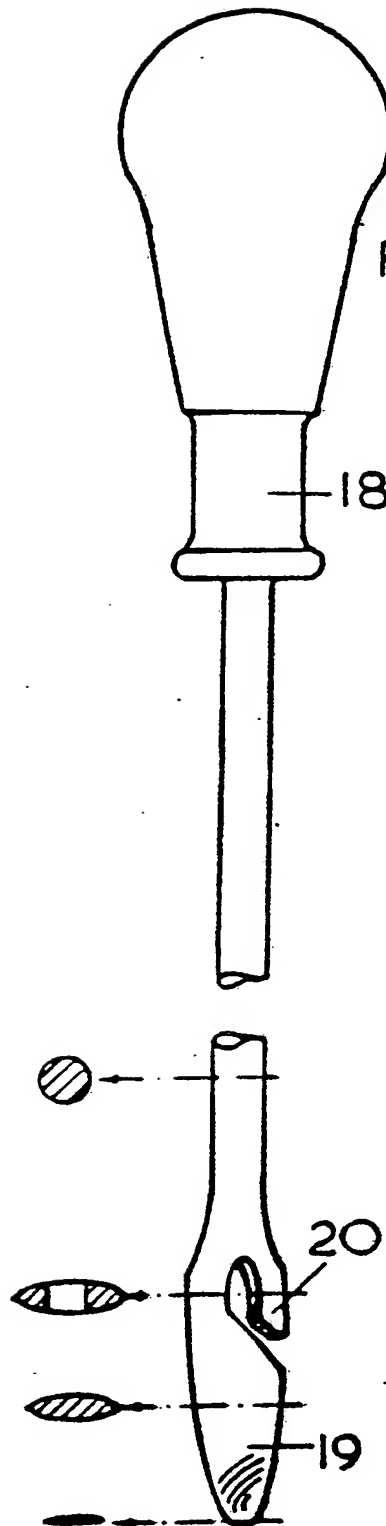


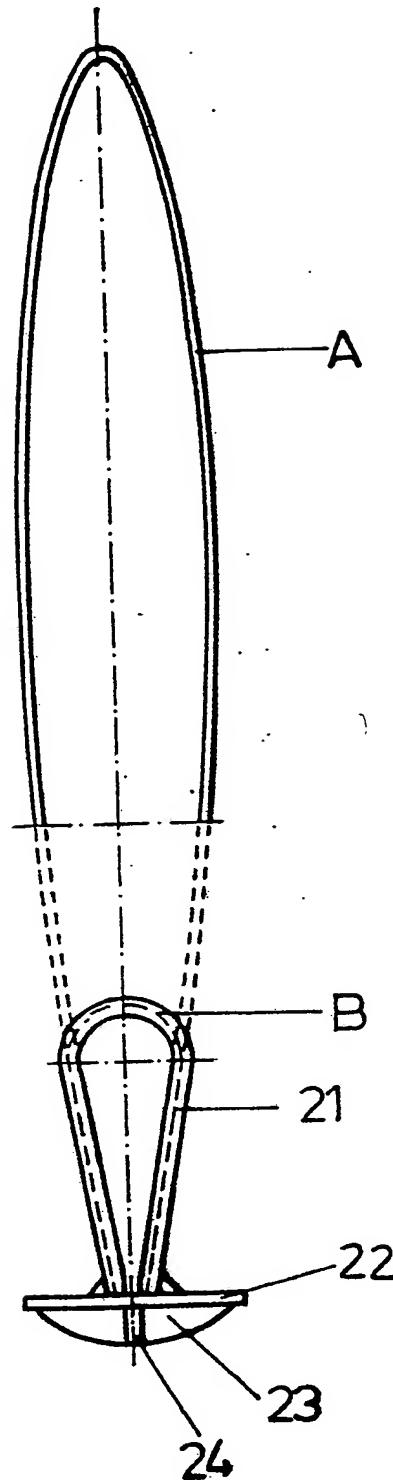
FIG. 6



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3/3 FIG. 7



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INTERNATIONAL SEARCH REPORT

International Application No PCT/EP 84/00273

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ² According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁴ : A 22 B 7/00; A 22 C 15/00																							
II. FIELDS SEARCHED <div style="text-align: center; margin-top: 5px;">Minimum Documentation Searched ⁴</div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">Classification System</th> <th style="width: 75%;">Classification Symbols</th> </tr> <tr> <td style="padding: 5px;">IPC⁴</td> <td style="padding: 5px;">A 22 B; A 22 C; B 29 F; B 65 G</td> </tr> </table> <div style="text-align: center; margin-top: 5px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵</div>			Classification System	Classification Symbols	IPC ⁴	A 22 B; A 22 C; B 29 F; B 65 G																	
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III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Category ⁶</th> <th style="width: 60%;">Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷</th> <th style="width: 30%;">Relevant to Claim No. ¹⁸</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">X</td> <td style="vertical-align: top;">WO, A, 8302048 (LUGTIGHEID) 23 June 1983 see the entire document</td> <td style="text-align: center; vertical-align: top;">1-7</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td style="text-align: center; vertical-align: top;">---</td> <td style="text-align: center; vertical-align: top;">8,9</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td style="vertical-align: top;">NL, A, 279815 (VAN BUUREN) 25 November 1964 see page 3, line 31 - page 4, line 50; claim 1</td> <td style="text-align: center; vertical-align: top;">8,9</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td style="vertical-align: top;">US, A, 4178342 (KLEIN) 11 December 1979 see column 4, lines 31-57</td> <td style="text-align: center; vertical-align: top;">8,9</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td style="vertical-align: top;">FR, A, 1561557 (DENNISON MANUFACTURING COMPANY) 28 March 1969 see page 1, left-hand column, line 20 - right-hand column, line 16</td> <td style="text-align: center; vertical-align: top;">8,9</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td style="vertical-align: top;">US, A, 4198370 (SUZUKI) 15 April 1980 see column 4, lines 10-48 -----</td> <td style="text-align: center; vertical-align: top;">8,9</td> </tr> </tbody> </table>			Category ⁶	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸	X	WO, A, 8302048 (LUGTIGHEID) 23 June 1983 see the entire document	1-7	Y	---	8,9	Y	NL, A, 279815 (VAN BUUREN) 25 November 1964 see page 3, line 31 - page 4, line 50; claim 1	8,9	A	US, A, 4178342 (KLEIN) 11 December 1979 see column 4, lines 31-57	8,9	A	FR, A, 1561557 (DENNISON MANUFACTURING COMPANY) 28 March 1969 see page 1, left-hand column, line 20 - right-hand column, line 16	8,9	A	US, A, 4198370 (SUZUKI) 15 April 1980 see column 4, lines 10-48 -----	8,9
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<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁵ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p> </div> </div>																							
IV. CERTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> Date of the Actual Completion of the International Search ³ <div style="text-align: center; font-size: 1.2em;">26th November 1984</div> </td> <td style="width: 50%; padding: 5px;"> Date of Mailing of this International Search Report <div style="text-align: center; font-size: 1.2em;">17 JAN. 1985</div> </td> </tr> <tr> <td style="width: 50%; padding: 5px;"> International Searching Authority ¹ <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div> </td> <td style="width: 50%; padding: 5px;"> Signature of Authorized Officer ²⁰ <div style="text-align: right;"> G.L.M. Kruidenberg </div> </td> </tr> </table>			Date of the Actual Completion of the International Search ³ <div style="text-align: center; font-size: 1.2em;">26th November 1984</div>	Date of Mailing of this International Search Report <div style="text-align: center; font-size: 1.2em;">17 JAN. 1985</div>	International Searching Authority ¹ <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div>	Signature of Authorized Officer ²⁰ <div style="text-align: right;"> G.L.M. Kruidenberg </div>																	
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INTERNATIONAL APPLICATION NO.
-----PCT/EP 84/00273 (SA 7885)

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO-A- 8302048	23/06/83	DE-A- 3148924 EP-A- 0097190	23/06/83 04/01/84
NL-A- 279815		None	
US-A- 4178342	11/12/79	CA-A- 1054366 JP-A- 52000674	15/05/79 06/01/77
FR-A- 1561557	28/03/69	BE-A- 712724	31/07/68
US-A- 4198370	15/04/80	None	

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